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# AGRICULTURAL ENGINEERING

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## Agricultural engineering.

Activities of U. S. Bureau of Agricultural Engineering. Farm Implement News. V.53, No.34. December 8, 1932. p.31.

Inexpensive changes cut farm costs. By S. H. McCrory. Better Farm Equipment and Methods. V.5, No.4. December 1932. p.6,18  
Work of Bureau of Agricultural Engineering on farm structures, drainage, irrigation, soil erosion and improvement.

## Agriculture.

Planned engineered agriculture. By F. W. Duffee. Agricultural Engineering. V.13, No.11. November 1932. p.275-278. It is job of agricultural engineer, working in close cooperation with economists and all other departments and agencies of agricultural production, to develop proper use and coordination of this equipment to entire farm business, in final interest of increasing profits and adding satisfactions to farm life.

Proposed engineering-economic policy for agriculture. By James A. King. Agricultural Engineering. V.13, No.11. November 1932. p.278.  
General plan involves following factors: 1. change in customs of land ownership; 2. constant effort to reduce unit costs of production; 3. maintaining and increasing fertility of soil; 4. greater efficiency and durability of all structures, improvements, and equipment; 5. decentralization of industry; 6. greater stability of consumer income; 7. further development of industries that use annual farm crops as their raw material.

## Air conditioning.

Air conditioning, where and how. By P. R. Randall. Power. V.76, No.6 December 1932. p.279-281. Review of general types of equipment and their fields of use.

Progress during 1932 in comfort cooling with ice. Refrigerating Engineering. V.24, No.5. November 1932. p.265-267.

Water coolers for air-conditioning systems using ice. By Clifford F. Holske. Refrigerating World. V.67, No.10 October 1932 p.15-18

Associations.

Program. A.S.A.E. Power and Machinery Division Meeting, Chicago, Ill.  
November 28-29, 1932. Agricultural Engineering. V.13, No.13.  
November 1932. p.298.

Building construction.

Brick that will hold nails weighs less than tile. Popular Mechanics Magazine. V.58, No.2. August 1932. p.247 Fireproof and weigh 20 per cent less than hollow tile. Good insulation properties. Heat-treated clay or shale expands forming minute air cells to give brick lightness and uniformity.

Building cycles charted from 1875 to 1932. Engineering News Record. V.109, No.19 November 10, 1932 p.567-569. Sub-report of committee on business reports, statistics and trade information to National Construction Conference. During 58 year period charts based on 1913 dollar show gradual decline in activity and wide divergency from general business movements.

Can new construction restore prosperity? By E. C. Harwood. Mechanical Engineering. V.54, No.12. December 1932. p.837-840. Principles which have become evident: 1. Extensive borrowings for new construction in order to avoid depression or restore prosperity are hopeless and dangerous expedient. 2. New construction, even when it avoids creation of new plants and manufacturing facilities, cannot restore prosperity. 3. New construction is practical means of alleviating unemployment situation, but wages paid must be least which will provide bare living.

Colorado River.

Colorado River aqueduct for bringing water to southern California. By Earl E. Thomas. General Electric Review. V.35, No.11. November 1932. p.554-559. Need for water; water supply; choice and location of aqueduct; Parker route; Parker dam; pumping plants; distribution system; generating plants; transmission line; construction material required; financial summary; comparison with Hoover dam.

Water from the Colorado River. 1931 3lp. Metropolitan Water District of Southern California, Los Angeles. Outline of Boulder Canyon Dam project on Colorado River and Metropolitan Aqueduct.

Cotton.

Interrelation of factors controlling the production of cotton under irrigation in the Sudan. By F. G. Gregory, F. Crowther and A. R. Lambert. Journal of Agricultural Science. V.22, Pt. 3. July, 1932. p.617-638.

Dairy equipment.

Sanitary care, operation, and installation of milking machines. By J. L. Henderson, C. L. Roadhouse and A. Folger. 1932. 16p. California. Agricultural Extension Service. Circular No. 69.

Dams.

Current dam construction in southern California. By J. I. Ballard. Engineering News Record. V.109, No.19. November 10, 1932. p.564-567. Distinct types of design represented on each of four structures. 1500 men employed and \$18,000,000 of construction involved. Projects will regulate water for municipal use and flood control. Bouquet Canyon Dam. Pine Canyon Dam. San Gabriel No. 2 Dam. El Capitan Dam.

Why not steel dams? By C. Maxwell Stanley. Engineering News Record. V.109, No.22. December 1, 1932. p.652-654. Review of pros and cons of metal dam construction in light of present-day developments in design, fabrication, non-corrosive metallurgy and surface protection. Editorial p.658.

Drainage.

Tile draining with tractor outfits: Editorial. Implement and Machinery Review. V.58, No.691. November 1, 1932. p.540-541. Discussion of "Toppelsdorfer" system, basis of which is operation of farm tractor on stationary power unit plan, and for this windlass and anchor methods are required.

Electricity in the home.

Residence load characteristics based on field studies. By G. L. Jorgensen and R. L. Matteson. Electrical World. V.100, No.21. November 19, 1932. p.684-688. Guesses and assumptions as to diversity and load factor practically eliminated from rate and cost determinations for domestic services by extensive survey of time occurrences and quantities of energy usage in large number of typical homes.

Electricity on the farm.

Artificial light and plant growth. By Dr. John M. Arthur. Agricultural Engineering. V.13, No.11, November 1932. p.288-291.

Average farm customer pays \$81.40 annually. Electrical World. V.100, No.20. November 12, 1932. p.664-665. Out of total of 6,288,544 farms in United States as of April 1, 1930, 841,333 are reported as having farmer's dwelling lighted by electricity. 570,953 reported paying aggregate of \$46,480,436 to power companies for electric light and power during 1929. 256,656 had electric motors.

Electricity on the farm. (Cont'd.)

Operating cost of the individual farm electric plant. By Frank D. Paine and Frank J. Zink. 1932. 15p. Electric service for the Iowa farm Report No. 7 Iowa Engineering Experiment Station Project No. 123.

Study of isolated electric plant costs. By A. G. Tyler. Agricultural Engineering. V.13, No.11. November 1932. p.291-292. Investigation carried on at University of Minnesota, 1923 to 1928.

Erosion control.

Soil fertility. By R. I. Throckmorton and F. L. Duley. 1932. 60p. Kansas. Agricultural Experiment Station. Bulletin No. 260. Soil erosion by water, p.22. Erosion by wind-blowing, p.23. Soil erosion control, p.25-29. Control of soil blowing, p.29-30.

Farm buildings.

Milk houses. By W. C. Harrington and H. E. Bremer. 1932. 16p. Vermont Department of Agriculture. Bulletin No. 40.

Farm machinery.

Machinery conquers sugar beets. Northwest Farm Equipment Journal. V.46, No.11. November 1932. p.20-21. New harvester completes cycle of mechanical operation.

Mechanization and British agriculture, being the report of a conference held at Rothamsted on February 9, 1932 under the chairmanship of the Right Hon. the Earl of Radnor. Harpenden, Rothamsted Experimental Station. 1932. 55p.

More power or less? By E. V. Wilcox. Country Gentleman. V.102, No.7. July 1932. p.12-13, 20. General use of modern farm machinery is development of past two decades. We couldn't learn all about use and effect of these devices in that brief span. Mere fact of newness partly explains present confusion of ideas about machines.

Power-driven corn pickers eliminate one of the hardest farm jobs. By E. T. Leavitt. American Thresherman. V.35, No.8. September-October 1932. p.4-5.

Who wants to go back? By W. H. McFeters. New England Homestead. V.105, No.9. October 29, 1932. p.3, 10. Buy equipment with which to produce efficiently and be sure by thorough investigation that it is what is needed. Take care of it so that it will give maximum efficiency and long service.

### Fertilizers.

Effect of fertilizers on crop yields of different soils and on the composition of certain crops. By S. C. Vandecaveye and G. O. Baker. 1932. 55p. Washington. Agricultural Experiment Station. Bulletin No. 274.

Substituting fertilizers, green manure, and peat for stable manure in growing of vegetables. By F. K. Crandall and T. E. Odland. 1932. 53p. Rhode Island. Agricultural Experiment Station. Bulletin No. 234.

### Filters and Filtration.

Destruction of carbohydrates and organic acids by bacteria from a trickling filter. By Max Levine and J. H. Watkins. 1932. 54 p. Iowa. Engineering Experiment Station. Bulletin No. 110.

### Fire protection.

Fire protection for the farmer. By E. T. Leavitt. Implement and Tractor Trade Journal. V.47, No.24. November 19, 1932. p.16. Tremendous annual loss from flames can be used as additional argument in selling water supply systems.

### Floods and flood control.

High September floods along the Rio Grande. By L. M. Lawson. Engineering News Recrd. V.109, No.19. November 10, 1932. p.557. Table gives gage heights and estimated discharges - lower Rio Grande flood peaks, September, 1932. Approximately 50,000 acres of land on American side in lower delta county was overflowed, and on Mexican side estimates made from airplane surveys show over 150,000 acres overflowed. Editorial, p.370.

Losses and damages resulting from the flood of 1927, Mississippi River and tributaries, in the States of Illinois, Missouri, Kentucky, Tennessee, Arkansas, Mississippi, and Louisiana. Mississippi River Flood Control Association. Memphis, Tennessee. 1928? 213p.

### Floors.

Studying the properties of floor covering. By J. W. McBurney. Commercial Standards Monthly. V.9, No.5. November 1932. p.113-114. Research on floor coverings in which carpet, rubber tile, and asphalt tile are considered.

### Forage drying.

Drying of legume hay plants. By Floyd Linville Higgins. 1932. 42p. Minnesota. Agricultural Experiment Station. Technical Bulletin No. 83. Study to determine role of leaves in drying stems and relation of method of drying to loss of leaves and chemical composition.

### Heat conduction.

Heat flow in refractories. By F. H. Norton. Fuels and Furnaces. V.10, No.9. November-December 1932. p.575-584. Thermal characteristics of heat flow and heat capacity of common types of refractories and insulators are discussed in detail..

### Heating.

Air supply and its effect on performance of oil burners and heating boilers. By L. E. Seeley, J. H. Powers and E. J. Tavanlar. Heating, Piping and Air Conditioning. V.4, No.12. December 1932. p.823-826. Deals with certain performance features related to manner in which air for combustion of oil is supplied. Proposes to show: 1. Effect of furnace draft variations; 2. Probable cause of draft difficulty; 3. Limiting factors relative to capacities obtainable; 4. Possible explanation for inability in some cases to obtain full rated capacity of burner.

Effective heat from radiators. By M. William Ehrlich. Aero-logist. V.8, No.12. December 1932. p.5-8,30.

Generation of heat. By E. V. Hill. Aero-logist. V.8, No.12. December 1932. p.20-24. Fundamentals of combustion in boilers and furnaces.

### Hotbeds.

Hotbeds and coldframes. By J. T. Quinn. 1932. 4p. Missouri. Agricultural Extension Service. Circular No. 292.

### Houses.

Clean up and repair of the home and community. 1932. 7p. Oklahoma Agricultural and Mechanical College. Extension Service. Circular No. 290.

Farm and village housing. Prepared by Bruce L. Melvin. Washington, D.C. 1932. 293p. Report of the Committee on Farm and Village Housing. President's Conference on Home Building and Home Ownership.

Small house of the future. By L. E. Olsen. Clay Worker. V.98, No.5. November 1932. p. 186-187. Made entirely of "face brick" inside and out, partitions, floors, stairs and cases. Savings in cost will come chiefly from elimination of non-essentials in design, shop fabrication of interior and lessened financing cost of whole structure.

### Hydraulics.

Cavitation and its influence on hydraulic turbine design; paints and corrosion. Report of Hydraulic Power Committee, Engineering National Section. New York. National Electric Light Association. 1932 20p. N.E.L.A. Publication No. 222.

Rapid filter hydraulics disclosed by experiments. Engineering News Record. V.109, No.22. December 1, 1932. p.647-650. Detroit investigators evaluate loss of head resulting from passage of clean water through bed of graded sand in terms of physical factors involved: depth, rate, size, porosity and temperature. Editorial p.659.

### Insulation.

Migration of moisture in refrigeration insulation. Part II. By Hal W. McPherson. Refrigerating Engineering. V.24, No.5. November 1932. p.277-282. Drenching as function of room dew point; Breathing as cause of infiltration; Initial moisture content and vapor pressure; Leaks and venting; Odor as index.

Modern heat insulation. By Reginald Trautschold. Power Plant Engineering. V.36, No.20. December 1932. p.812-814. Greater opportunities for saving lie in decreasing heat wastage than in increasing efficiency of heat utilization.

### Irrigation.

Activities of the Bureau of Standards. By H. D. Hubbard. Commercial Standards Monthly. V.9, No.5. November 1932. p.101-103. Research and testing conducted for Government, Industry and Public.

Effect of the frequency of irrigation on potatoes grown in Mimbres Valley, New Mexico. By Dean W. Bloodgood. 1932. 28p. New Mexico. Agricultural Experiment Station Bulletin No. 205.

Efficient use of irrigation water. By R. L. Farshall. Through the Leaves. V.20, No.6. November 1932. p.187-188. Heavy losses at headgate; Sand and silt cause trouble.

Evaporation loss -- it's small. By G. E. P. Smith. Arizona Producer. V.11, No.17. November 15, 1932. p.3.

Irrigation district will pay for all-American canal. Engineering News Record. V.109, No.23. December 8, 1932. p.696. Contract provides for unification of lands to be served, by inclusion in Imperial Irrigation District. Canal is estimated to cost about \$38,500,000 and will carry water from Colorado River to Imperial and Coachella Valleys.

Irrigation of orchards by sprinkling. By F. L. Overley and others. 1932. 50p. Washington. Agricultural Experiment Station. Bulletin No. 268.

Irrigation. (Cont'd.)

"Salt balance" upsets old irrigation theory. Utah Farmer. V.26, No.7 November 10, 1932. p.5. In well-managed irrigation projects drainage water carries away as much salt as is brought in by irrigation water. Where drainage water with its higher salt content is reclaimed and used for irrigation it is necessary to use larger quantities for each acre served in order to maintain favorable salt balance.

Uniformity of distribution of water. By G. E. P. Smith. Arizona Producer. V.11, No.17. November 1, 1932. p.3. Irregular distribution is principal cause of excessive use or waste of water as well as of lack of uniformity in growth and production of irrigated crops.

Lubrication.

Lubrication technique. By Burt L. Newkirk. Refrigerating Engineering. V.24, No.5. November 1932. p.268-272. Boundary lubrication; two methods combined; stability of fluid film.

Meters.

Flow meters. By Louis Gess. Heating, Piping and Air Conditioning. V.4, No.12. December 1932. p.792-793. Suggestions for avoiding expensive changes in installed piping to permit accurate metering.

Miscellaneous.

Conservation sidelights on reorganization. By Ovid Butler. 1932. 4p. Reprinted from American Forests. Discussion of plan of reorganization of whole structure of Federal Government.

Developments and trends in mechanical engineering: Brief review of science, mechanical technology, and professional development in 1932. Mechanical Engineering. V.54, No.12. December 1932. p.845-858.

Fifty-fourth annual report. North Carolina. Agricultural Experiment Station. 1931. 130p. Report on soil erosion, p.47-52.

Foundations of science. By W. F. Sutherland. Hydro Electric Power Commission of Ontario. Bulletin. V.19, No.11. November 1932. p.360-369.

Ingenious mechanical movements. Machinery. V.39, No.4. December 1932. p.251-253. Mechanism selected by experienced machine designers as typical examples applicable in construction of automatic machines and other devices. Gearless variable-speed transmission, by R. T. Todd. Stop mechanism for a power press equipped with a magazine feed, by Edward Lay.

Map collections in the District of Columbia. 1932. 44p. Board of Surveys and Maps of the Federal Government. Committee on Information.

Miscellaneous. (Cont'd.)

Seventeenth annual report for the fiscal year ended June 30, 1931, including a report on project work to November 30, 1931. 1932. 53p. Arizona. College of Agriculture. Agricultural Extension Service. Extension project & circular No. 12. Irrigation practice, p.48-49.

Synchronized mechanical motion without mechanical connection. By C. W. Drake. Maintenance Engineering. V.90, No.12. December 1932. p.441-443.

Taxation and ability to pay in South Carolina. By G. H. Aull. 1932. 61p. South Carolina. Agricultural Experiment Station. Bulletin No.286.

Taxation of farmers in South Carolina. By G. H. Aull. 1932. 41p. South Carolina. Agricultural Experiment Station. Bulletin No.285.

Twelfth annual report of the Federal Power Commission. 1932. 266p.

United States inch. By H. W. Bearce. Commercial Standards Monthly. V.9, No.5. November 1932. p.111-112.

Moisture.

Plains farmer must prepare for dry years. By E. R. Parsons. Western Farm Life. V.34, No.17. October 15, 1932. p.3,12. Pays to carry over reserve moisture and surplus feed for bad season. Shallow plowing and want of fallowing that makes most of dry years.

Motors.

Care of electric motors. By B. W. Faber. Farm Implement News. V.53, No.34. December 8, 1932. p.28-29. Lubrication; Oiling new motors; Brush and commutator care; Turning down a commutator; Avoid dust and water; House the farm motor.

Control of motors driving ventilating fans. By Samuel R. Lewis. Heating, Piping and Air Conditioning. V.4, No.12. December 1932. p.794-796. Describes how motors for fans are controlled by means of electricity and compressed air.

Power by electric motor. By H. M. French. Southern Power Journal. V.50, No.12. December 1932. p.34-40. Part 5 - Choice of type of motor. Chart gives factors of importance in choice of electric motors.

Plows and plowing.

Building a case against the bogus plow share. Printers' Ink. V.160, No.9. September 1, 1932. p.64-65. How Oliver, entering a usurped field, induces its customers to buy genuine, authorized parts.

Plows and plowing. (Cont'd.)

High speed plowing: Editorial. Farm Implement News. V.53, No.33. November 24, 1932. p.10. Share weakness may be said to be limiting factor in high speed plowing. One result of use of air tires and higher speed tractors may be renewed interest in alloy steel and iron for plow material.

Poultry houses.

Artificial lighting for poultry. By Luther Banta. 1932. 8p. Massachusetts State College. Extension Service. Extension Leaflet No. 141.

Construction of brooder houses for Colorado. By O. C. Ufford and Fred E. Goetz. 1932. 11p. Colorado Agricultural College. Extension Service. Bulletin 320-A.

Construction of laying houses for Colorado. By O. C. Ufford and Fred E. Goetz. 1932. 20p. Colorado Agricultural College. Extension Service. Bulletin 321-A.

Equipment for chickens. 1932. 4p. Nebraska Agricultural College. Extension Service. Extension Circular 1468.

Outdoor feeders for growing pullets or turkeys. By J. H. Claybaugh. 1932. 4p. Nebraska Agricultural College. Extension Service. Extension Circular No. 1469.

Poultry house remodeling. By J. H. Claybaugh and Paul R. Höff. 1932. 8p. Nebraska Agricultural College. Extension Service. Extension Circular 1470.

Pumps and pumping.

Low-cost pump installation. Dakota Farmer. V.52, No.20. October 1, 1932. p.464. No pump-head required in this system. Illustration for drawings explain installation in detail.

Pumps - big and small, rotary and reciprocating - their lubrication. By Allen F. Brewer. Pt. 2. Southern Power Journal. V.50, No.12. December 1932. p.18-20.

Rain and rainfall.

Comparison of methods for determining the areal mean precipitation on drainage areas. By John B. Belknap. Journal of the New England Water Works Association. V.46, No.3. September 1932. p.272-282.

Revised method of averaging Oregon precipitation figures. By L. L. Harrold. Engineering News Record. V.109, No.22. December 1, 1932. p.643. State is now divided into 13 nearly equal sections, 4 in western division and 9 in eastern division. Average precipitation and temperature is computed for each of these sections by averaging all stations having ten or more years of record. Arithmetic mean of 13 section averages now gives State average.

## Reclamation.

Reclamation of the Zuiderzee. By Arthur L. Shaw. Engineering News Record. V.109, No.22. December 1, 1932. p.639-643. Twenty miles of massive dikes built to shut off major part of Zuiderzee from North Sea. Sections of inclosed area now being diked off and drained for agricultural purposes.

## Rivers.

North Idaho wants a water outlet. Idaho Farmer. V.50, No.18. October 20, 1932. p.2,6. Navigation on Snake River urged as necessary step to develop vast interior empire.

Preparing for river diversion at Hoover dam. Engineering News Record. V.109, No.21. November 24, 1932. p.622-624. First-hand glimpse of work recently centered at upper portals of diversion tunnels and outline of operations required to complete river diversion.

## Roofs.

Durability of prepared roll roofings. By Henry Giese, H. J. Barre, J. Brownlee Davidson. 1932. 59p. Iowa Engineering Experiment Station. Bulletin No. 109.

Roofs of cotton cloth. Architectural Forum. V.57, No.3. September 1932. p.28. Fabric is treated with special paint and may be applied easily over any type of original roofing forming surface which gives old roof new lease on life. Occasional painting is only maintenance required, and when properly set is good for many years of service.

## Septic tanks.

Septic tanks for farm homes. By Wellesley C. Harrington. 1932. 8p. Massachusetts. State College. Extension Service. Extension Leaflet No. 143.

## Silos.

Newer developments regarding silos and silage. By A. E. Perkins. Ohio Agricultural Experiment Station. Bimonthly bulletin No. 159. November-December, 1932. p.207-214.

Trench silo. By E. J. Maynard. 1932. 12p. Utah Agricultural College. Extension Service. New series Circular No. 50.

Trench silo in Arizona. By R. N. Davis, 1932. 20p. Arizona. College of Agriculture. Agricultural Extension Service. Extension Circular No. 74.

## Soils.

Cures for sick soils. By Paul Emerson. Country Gentleman. V.102, No.7. July 1932. p.37. Simple way to test land and prescribe fertilizer to fit.

Dynamic properties of soil. By M. L. Nichols and T. H. Kummer. Agricultural Engineering. V.13, No.11. November 1932. p.279-285. Pt. IV. Method of analysis of plow moldboard design based upon dynamic properties of soil. Mechanical functions of plow. Study of perpendicular differential sections. Preliminary investigation of inversion method of expressing moldboard surface mathematically. Study of spiral sections. Variations in application of principles to design.

Effect of climatic variations on the plasticity of soil. By G. W. Scott Blair and F. Yates. Journal of Agricultural Science... V.22, Pt.3. July 1932. p.639-646.

Method for determining combined water and organic matter in soils. By George Bouyoucos. Soil Science. V.34, No.4. October 1932. p.259-265. Combined water is water which remains in soils after they have been dried at temperature of 108° C. for 24 hours.

Representation of soil analyses by the device of double plotting. By W. Heber Green. Journal of Agricultural Science. V.22, Pt.3. July 1932. p.548-550.

Soil action shown by model: Letter from U. S. Housel. Engineering News Record. V.109, No.21. November 24, 1932. p.626-627.

## Specifications.

Hoover dam cement specifications tentatively formulated. By John L. Savage. Engineering News Record. V.109, No.19. November 10, 1932. p.558-560. Reclamation Bureau engineers and consulting boards decide to call for two cements of low and moderate heat evolution respectively. Fineness to be rated by surface area. Briquet replaced by crushing test on concrete cylinders. Editorial, p.571.

## Steam.

Steam reheating --- Reasons, Methods, Advantages. By R. L. Reynolds. Pt. 1. Southern Power Journal. V.50, No.12. December 1932. p.30-33. Purpose of steam reheating is to make greater portion of heat of fuel available for mechanical work. Steam reheating cycle increases thermal efficiency by providing steam in more usable form to low pressure stages of turbines.

Storage houses and cellars.

Home storage of fruits and vegetables. By Frank H. Beach and Earl B. Tussing. 1931. 11p. Ohio. Agricultural College. Extension Service. Bulletin No. 123.

Home storage of vegetables. By Robert M. Adams. 1930. 13p. Cornell University. Extension Bulletin No. 193.

Home storage of vegetables. By C. L. Fitch. 1932. 8p. Iowa State College of Agriculture and Mechanic Arts. Extension Service. Extension Bulletin No. 184.

Sweet potato storage in tobacco barns. By W. R. Wells, Jr. 1932. 7p. South Carolina. Clemson Agricultural College. Extension Service. Circular No. 124.

Utilization of flue-heated tobacco barns for sweet potato storage. By Fred E. Miller. 1932. 6p. U. S. Department of Agriculture. Farmers' Bulletin No. 1267.

Vegetable storage. By J. R. Hepler. 1932. 4p. University of New Hampshire. Extension Service. Extension Circular No. 140.

Terracing.

Operation of power machinery on terraced land. By R. W. Baird. Agricultural Engineering. V.13, No.11. November 1932. p.286-287. Additional requirements for satisfactory operation of tractor machinery on terraces are: 1. Greater range of vertical adjustments that can be made by operator from tractor seat. 2. Greater flexibility of machine. 3. More positive steering control. 4. More compact units. 5. Greater care in selecting width of machine to fit terraces.

Tires.

Farmers approve new air tires. Implement and Tractor Trade Journal. V.47, No.24. November 19, 1932. p.6-7. Demonstrations throughout farming territory bring large crowds which marvel at increased performance of tractors.

Reports show advantages of new tractor tires. Wisconsin. Agriculturist and Farmer. V.59, No.22, October 29, 1932. p.12. 1. Use less gasoline. 2. Reduce vibration. 3. Do not pack soil. 4. Higher speeds in high gear. 5. Reduce rolling resistance. 6. Increase use of tractor. 7. Ease of riding. 8. Low price. 9. Maximum traction.

Riding on lazy air with new super-balloon tires. By Morgan W. Gibney. Popular Mechanics Magazine. V.58, No.2. August 1932. p.210-213, 126A, 128A.

Tires. (Cont'd.)

Tractors now to ride on air. Northwest Farm Equipment Journal.  
V.46, No.11. November 1932. p.19-20.

Tractors.

Elastic drawbar. By Wm. Vutz. Agricultural Engineering. V.13, No.11. November 1932. p.293-295. With increasing versatility of tractor, shock absorbers will come to be regarded not as necessities from operating standpoint, but as means of getting maximum returns out of capital investment.

Tractors need good air cleaners. Implement and Tractor Trade Journal. V.47, No.24. November 19, 1932. p.9,11. Air cleaner should provide positive cleaning, be efficient at all speeds, have ample capacity for work, not clog nor load up, not restrict flow of air at any speed.

Wheel "arms" help tractor over soft ground. Popular Mechanics Magazine. V.58, No.2. August 1932. p.265. Blades, which are curved and attached in circle, are hinged to rims of tractor wheels; normally, they lie flat against the wheel, but when driver sees muddy spot in path, he pulls lever that extends arms from side of each wheel. This gives wheels greater traction and prevents them from sinking into soft ground.

Ventilation.

Barn ventilation. By H. B. White. 1932. 1 p. University of Minnesota. Agricultural Extension Division. Agricultural Engineering News Letter No. 8.

Dairy barn ventilation. By A. R. Merrill. 1932. 12p. Connecticut Agricultural College. Extension Service. Bulletin No. 174.

Heat production of cattle in a respiration calorimeter as related to the rate of ventilation and to the moisture content of the air. By E. B. Forbes, Winfred W. Braman, and Max Kriss. Journal of Nutrition. V.5, No.4. July 1932. p.387-394.

Walls.

Compound seals leaky concrete walls. Popular Mechanics Magazine. V.58, No.2. August 1932. p.234. Newly developed waterproofing compound which may be applied on interior surfaces without reducing its effectiveness. Unaffected by temperature or exposure to elements. Has also demonstrated its value as binder between various layers of concrete, and eliminates minute seam which frequently results from interrupted pourings. Efficient waterproof bond between old and new surfaces.

Walls. (Cont'd.)

Unit wall construction. Architectural Forum. V.57, No.3. September 1932. p.26. Simplified construction, elimination of clean-up costs, and adaptability to any type of interior finish are combined with other advantages in new unit non-load bearing wall construction. Built of large asbestos-concrete fireproof units to which finishing material is cemented by thermal plastic process at factory, panels are locked into each face of 3 inch thick copper bearing steel studs, which, in turn, rest in steel floor and ceiling channels. Studs are spaced on 24 inch centers.

Water.

Ground water in north-central Tennessee. By Arthur M. Piper. 1932. 238p. U. S. Geological Survey Water Supply Paper No.640.

Index of analyses of natural waters in the United States, 1926 to 1931. By W. D. Collins and C. S. Howard. 1932. 191-209p. U. S. Geological Survey. Water Supply Paper 659C.

Water heating.

Low water-heating costs with oil. By W. O. Harvey. Fuel Oil Journal. V.11, No.6. December 1932. p.17-18, 88-89.

Solar water heaters. By Frazier Rogers. 1932. 10p. Florida. Agricultural Extension Service. Bulletin No. 68.

Wells.

Artesian wells as a source of water for the Winnott project, Montana. By Eugene S. Perry. 1932. 5p. multigraphed. Montana. Bureau of Mines and Geology. Miscellaneous contribution No. 1.

Bulletin on private wells and springs: How to secure a safe water supply. 1932. 11p. Alabama. State Board of Health.

Shallow wells near Terry, Montana, as a source of irrigation water. By Eugene S. Perry. 1932. 7p. multigraphed. Montana. Bureau of Mines and Geology. Miscellaneous contribution No. 3.

Wood.

Bearing strength of wood under bolts. By George M. Trayer. 1932. 40p. U. S. Department of Agriculture. Technical Bulletin No.332.

Chemical utilization of wood. By Henry K. Bonson. 1932. 151p. National Committee on Wood Utilization. Twenty-second report.

